(g) The parameter Ω depends critically upon $\overline{w_s}$, the sediment fall velocity. It is unclear how the relationships described above apply to shorefaces where the grain size varies widely or where there is a distinct bimodal distribution. For example, many Great Lakes beaches contain material ranging in size from silt and clay to cobble several centimeters in diameter. During storms, not only do wave height and period change, but fine-grain sediment is preferentially removed from the shoreface; therefore, the effective $\overline{w_s}$ may change greatly within a few hours. Further research is needed to understand how Great Lakes beaches change modally and temporally.

(2) Highly dissipative stage (Figure IV-3-34a). The dissipative end of the continuum is analogous to the "storm" or "winter beach" profile described by Bascom (1964) for shores that vary seasonally. The characteristic feature of these beaches is that waves break by spilling and dissipating progressively as they cross a wide surf zone, finally becoming very small at the upper portion of the foreshore (Figure IV-3-35) (Wright and Short 1984). A dissipative surf zone is broad and shallow and may contain two or three sets of bars upon which breakers spill. Longshore beach variability is minimal.

Figure IV-3-35. Example of a dissipative beach: Southern California near San Diego

(3) Highly reflective stage (Figure IV-3-34f). On a fully reflective beach, breakers impinge directly on the shore without breaking on offshore bars (Figures IV-3-36 and 37). As breakers collapse, the wave uprush surges up a steep foreshore. At the bottom of the steep, usually linear beach is a pronounced step composed of coarser material. Seaward of the step, the slope of the bed decreases appreciably. Rhythmic beach cusps are often present in the swash zone. The fully reflective stage is analogous to the fully accreted "summer profile."

(4) Surf-scaling parameter. Morphodynamically, the two end members of the beach state model can be distinguished on the basis of the surf-scaling parameter (Guza and Inman 1975):